Listing of Claims

1. (Currently amended) A method of producing a protein with an increased activity or stability, comprising:

replacing an arginine residue in a polypeptide of interest ~~capable of being ADP-ribosylated~~ with a tryptophan residue or a phenylalanine residue to produce a tryptophan-substituted or phenylalanine-substituted polypeptide ~~in a position of an amino acid sequence of the protein~~; and

comparing the antimicrobial activity or polypeptide stability of the polypeptide of interest with the tryptophan-substituted or phenylalanine-substituted polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted polypeptide has increased antimicrobial activity or polypeptide stability compared to the polypeptide of interest, and wherein the tryptophan-substituted or phenylalanine-substituted polypeptide has similar antimicrobial activity or polypeptide stability to the polypeptide of interest wherein the arginine residue is ADP-ribosylated,

thereby producing the protein with increased activity or stability.

2. (Original) The method of claim 1, wherein the protein has an increased antimicrobial activity.

3. (Original) The method of claim 2, wherein the antimicrobial activity comprises chemotaxis of T cells, neutrophil recruitment, or cytokine release.

4. (Original) The method of claim 3, wherein the cytokine release comprises interleukin-8 release.

5. (Original) The method of claim 2, wherein the protein is a defensin.

6. (Original) The method of claim 5, wherein the defensin is an alpha defensin.

7. (Original) The method of claim 2, wherein the arginine residue is substituted in the amino acid sequence of the protein with a tryptophan residue.

8. (Original) The method of claim 2, wherein the arginine residue is substituted in the amino acid sequence of the protein with a phenylalanine residue.

9. (Original) The method of claim 2, wherein the activity is increased as compared to a polypeptide having an arginine residue in the position of the amino acid sequence of the protein.

10. (Original) The method of claim 2, wherein the stability is increased as compared to a polypeptide having an arginine residue in the position of the amino acid sequence of the protein.

11. (Original) The method of claim 2, wherein the increased activity or stability is a 100% increase, or a 100% decrease, as compared to a control polypeptide.

12. (Original) The method of claim 2, wherein the increased activity or stability is a 50% increase, or a 50% decrease, as compared to a control polypeptide.

13-18. (Canceled)

19. (Currently amended) A composition comprising, a polypeptide of interest comprising an amino acid sequence wherein at least one arginine residue in the polypeptide of interest ~~capable of being ADP-ribosylated~~ is substituted with a tryptophan or a phenylalanine residue to produce a tryptophan-substituted or phenylalanine-substituted polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted polypeptide~~substitution increases the~~has increased antimicrobial activity or polypeptide stability, compared to ~~of~~ the polypeptide of interest wherein the at least one arginine residue is ADP-ribosylated.

20. (Currently amended) The composition of claim ~~21~~19, wherein the polypeptide has an antimicrobial activity.

21. (Original) The composition of claim 20, wherein the arginine residue is substituted with a tryptophan residue.

22. (Original) The composition of claim 20, wherein the arginine residue is substituted with a phenylalanine residue.

23. (Original) The composition of claim 20, wherein the antimicrobial activity comprises chemotaxis of T cells, neutrophil recruitment, or cytokine release.

24. (Original) The composition of claim 20, wherein the protein is a defensin.

25. (Original) The composition of claim 24, wherein the defensin is an alpha defensin.

26. (Original) A pharmaceutical composition comprising a therapeutically effective amount of a defensin comprising at least one arginine residue that is substituted by a tryptophan or a phenylalanine residue.

27. (Original) The pharmaceutical composition of claim 26, wherein the defensin has antimicrobial activity.

28. (Original) The pharmaceutical composition of claim 27, wherein the antimicrobial activity comprises chemotaxis of T cells, neutrophil recruitment or cytokine release.

29. (Currently amended) A method of increasing the activity or stability of a defensin polypeptide of interest~~comprising an arginine residue capable of being ADP-ribosylated~~, comprising:

substituting ~~the~~ an arginine residue in the defensin polypeptide of interest with a tryptophan or a phenylalanine to produce a tryptophan-substituted or phenylalanine-substituted defensin polypeptide;

comparing the antimicrobial activity or polypeptide stability of the defensin polypeptide of interest with the tryptophan-substituted or phenylalanine-substituted defensin polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted defensin polypeptide has increased antimicrobial activity or polypeptide stability compared to the

defensin polypeptide of interest, and wherein the tryptophan-substituted or phenylalanine-substituted defensin polypeptide has similar antimicrobial activity or polypeptide stability to the defensin polypeptide of interest wherein the arginine residue is ADP-ribosylated,
thereby increasing the activity or the stability of the defensin polypeptide.

30. (Original) The method of claim 29, wherein the defensin polypeptide is an alpha defensin.

31. (Original) The method of claim 29, wherein the activity is an antimicrobial activity.

32. (Original) The method of claim 31, wherein the antimicrobial activity comprises T cell chemotaxis, neutrophil recruitment, or cytokine release.

33. (Currently amended) A method of increasing an antimicrobial immune response in a subject infected with or at risk of being infected with a microbe, comprising administering to the subject a therapeutically effective amount of a defensin polypeptide comprising an amino acid substitution, wherein the amino acid substitution is a replacement of an arginine in a defensin polypeptide of interest with a tryptophan or a phenylalanine to produce a tryptophan-substituted or phenylalanine-substituted polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted polypeptide has increased antimicrobial activity or polypeptide stability, compared to the defensin polypeptide of interest wherein the at least one arginine residue is ADP-ribosylated~~capable of being ribosylated with a tryptophan or a phenylalanine~~,
thereby modifying the antimicrobial immune response in the subject infected with or at risk of being infected with a microbe.

34. (Original) The method of claim 33, wherein the immune response comprises T cell chemotaxis, neutrophil recruitment, or cytokine release.

35. (Original) The method of claim 33, wherein the subject has an immune disorder.